

AMENDMENTS TO THE CLAIMS

The following is a complete listing of the claims indicating the current status of each claim and including amendments currently entered as highlighted.

1-18. (Canceled)

19. (New) A fluid-film bearing device comprising:

a first bearing surface for disposing opposite a second bearing surface, to form a tribological pair,

wherein said first bearing surface includes at least two regions, a first region having a plurality of micropores, said first region characterized by an area density of micropores, S_{p1} ,

and a second region, wherein said second region has an area density of micropores that is less than S_{p1} ,

the fluid-film bearing designed and configured such that, when said first bearing surface is attached to a first machine component, and said second bearing surface is attached to a second machine component, said first surface and said second surface are moved in a relative motion with respect to one another, by a movement of at least one of said machine components,

said first and second regions arranged on said first bearing surface, such that during said movement of said machine components, said regions effect an equivalent clearance convergence between said surfaces in a direction of said relative motion,

such that said relative motion, acting on a fluid disposed between said surfaces, generates a pressure so as to generate a lifting force between said surfaces.

20. (New) The fluid-film bearing device of claim 19, wherein said first bearing surface is substantially rectangular, and wherein said direction of said relative motion is a linear direction.

21. (New) The fluid-film bearing device of claim 19, wherein said direction of said relative motion is circumferential.

22. (New) The fluid-film bearing device of claim 19, wherein said first bearing surface is substantially annular, and wherein said direction of said relative motion is a circumferential direction.

23. (New) The fluid-film bearing device of claim 19, wherein S_{pI} exceeds about 0.5.

24. (New) The fluid-film bearing device of claim 19, wherein said first bearing surface is substantially annular, and wherein said first region of said first bearing surface is substantially wedge-shaped.

25. (New) The fluid-film bearing device of claim 22, wherein said first bearing surface has an inner radius and an outer radius, and wherein said first region of said first bearing surface extends substantially from said inner radius to said outer radius.

26. (New) The fluid-film bearing device of claim 19, wherein a parameter α defines a ratio of surface area textured with said micropores to a total bearing surface area of said first bearing surface, and wherein α is between about 0.3 and about 0.8.

27. (New) The fluid-film bearing device of claim 26, wherein α is between about 0.5 and about 0.7.

28. (New) The fluid-film bearing device of claim 26, wherein S_p exceeds about 0.4.

29. (New) The fluid-film bearing device of claim 19, wherein said first region is parameterized by a width B^* in said direction of said relative motion, and a length L^* , and wherein L^*/B^* exceeds 0.2.

30. (New) The fluid-film bearing device of claim 29, wherein L^*/B^* exceeds 0.3.

31. (New) The fluid-film bearing device of claim 29, wherein L^*/B^* exceeds 0.5.

32. (New) The fluid-film bearing device of claim 29, wherein L^*/B^* exceeds 0.7.

33. (New) The fluid-film bearing device of claim 27, wherein said surfaces are nominally parallel.

34. (New) The fluid-film bearing device of claim 19, further comprising said second bearing surface.

35. (New) The fluid-film bearing device of claim 34, further comprising said first machine component and said second machine component, wherein a load is exerted on said bearing surfaces.

36. (New) The fluid-film bearing device of claim 35, wherein a parameter h_p is a dimensionless dimple depth, said dimensionless dimple depth defined by:

$$h_p = h_p^*/h_0^*$$

wherein

h_p^* is a characteristic dimple depth of said micropores, and

h_0^* is a minimum clearance between said surfaces,

and wherein h_p exceeds about 0.5.

37. (New) The bearing device of claim 36, wherein said relative motion is bi-directional, and wherein said first region having a plurality of micropores includes a first area and a second area, said first area disposed so as to effect an equivalent clearance convergence between said surfaces in a first direction of said relative motion, and said second area disposed so as to effect an equivalent clearance convergence between said surfaces in a second direction of said relative motion.